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ABSTRACT

The chronicle provides information on programs and other topics relevant to the education of gifted and talented students. The following are among the articles contained in this introductory publication: "PSAP: Its First Two-and-a-Half-Years" (about the Project for the Study of Academic Precocity) by C. Blurton; tips relating to parental support by W. George; "Able and Ambitious: Early Entrance to College, Part-Time" by S. Cohn; "Tenth Grade to College" by M. Frost; "Social and Emotional Development of Gifted Students" by P. Finlay; "Luck, Pluck, and Pluto" (about two scientists who discovered the planet Pluto) by E. Phelps; and "1982 Talent Searches across the United States" by C. Cohn. (SW)

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CHRONICLE
OF ACADEMIC AND ARTISTIC PRECOCITY

Vol. 1, No. 1

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INTRODUCING THE *CHRONICLE OF ACADEMIC AND ARTISTIC PRECOCITY*

*Sanford J. Cohn, Ph.D.**

Over the past two-and-a-half years, the Project for the Study of Academic Precocity (PSAP) in the Department of Special Education at Arizona State University has implemented and studied strategies for finding and helping youngsters who exhibit outstanding ability in academic and other talent areas. This brand new journal/bulletin, the *Chronicle of Academic and Artistic Precocity* (the *"Chronicle"* for short) represents an attempt to share information about programs, studies, and outstanding individuals with students who have taken part in some of PSAP's educational opportunities, their parents and school personnel, as well as with educators, psychologists, and other professionals who are interested in the education of gifted children and youths.

The *Chronicle* will report on opportunities available for able and eager youths around the country and whenever possible on the empirical evidence attesting to their effectiveness. Special features will include "TIPS" (that is, "Tips for Intellectually Precocious Students"), an advice column to help students and their families explore educational alternatives to the typical schooling process, "TAPS" (that is, "Tips for Artistically Precocious Students"), an advice column similar to TIPS, but focusing on opportunities in fine arts and performing arts, biographical sketches about eminent persons focusing on their educational development, articles by and about able and eager youths who have taken advantage of a variety of educational options, reviews of pertinent books and articles, reports of relevant research activities, and a challenging puzzle competition.

For those of you who remember the *ITYB* (Intellectually Talented Youth Bulletin), published from 1972 through 1979 by the Study of Mathematically Precocious Youth (SMPY) at The Johns Hopkins University, the *Chronicle* will offer a chance to refresh and up-date your awareness of progress that has been made in developing and implementing ways to find and help able children. It is important to note, however, that the *Chronicle* will include information relevant not only to academically talented youths, but also to youngsters talented in other areas as well.

The *Chronicle of Academic and Artistic Precocity* will be published once every two months throughout the year. A year's subscription (six issues) will cost $7.50. This, our first issue, has been provided to you free of charge as an introduction. An order blank is included on page 8.

It is our hope that you will find the information provided in our new publication helpful. If you have suggestions as to possible features or articles to include, we encourage you to share them with us at the above address. Let us know how we can best serve your needs and interests.

Sanford J. Cohn, Ph.D.
Director of PSAP
Publisher

*Dr. Cohn is the founder and director of PSAP along with his wife Catherine. He currently serves as Assistant Professor in ASU's Department of Special Education focusing full time in the area of educating the gifted.

PSAP: ITS FIRST TWO-AND-A-HALF YEARS

*Craig Blurton**

The Project for the Study of Academic Precocity (PSAP) grew out of Dr. Sanford J. Cohn's experiences during 1977 as a member of a task force working for the Office of Gifted and Talented (USOE) under the direction of Dr. Dorothy Sisk, then Director. The task force was formed at the governmental interagency level to coordinate programs, funding, and legislative initiatives for the Gifted and Talented.

The first issue addressed by members of the task force was to formulate a definition of 'giftedness' that could be broadly applied throughout the country but that could also be specific in precisely defining groups of the gifted and talented.

Dr. Cohn was asked by Dr. Sisk to address the issue in a working paper which he subsequently wrote, entitled *Strategies for a Pluralistic View of Giftedness and Talent*. In the paper, Dr. Cohn argued for a move away from vague, overlapping categories and modeled his method of identifying and labeling specific talent areas after the work done at The Johns Hopkins University by Dr. Julian Stanley's Study of Mathematically Precocious Youth (SMPY).

Although Stanley's work concentrated on the area of mathematics, Dr. Cohn saw a need to move into other areas, incorporating what had been learned at Johns Hopkins to analyze and define other academic talent dimensions.

After leaving Johns Hopkins University in 1979, where he had earned a B.A. in Pre-Med, an M.Ed. in Education of the Gifted, an M.A. in Differential Psychology, and a Ph.D. (in 1980) in Differential Psychology while studying under Professor Julian Stanley and working as the Assistant Director of the Study of Mathematically Precocious Youth (SMPY) and as the Editor of the (*ITYB*) Intellectually Talented Youth Bulletin, Dr. Cohn and his wife Cathy (who also graduated from Johns Hopkins with a B.A. in Math Sciences and an M.Ed. in Education of the Gifted studying under Professor Lynn Fox and working for Dr. Stanley as the Director of Educational Programs for SMPY), moved to Arizona to accept a position as Assistant Professor in the Department of Special Education at Arizona State University in Tempe, Arizona.

The Cohns founded PSAP and initiated its first Talent Search in September of 1979 to identify precocious mathematical and verbal reasoners. Dr. Cohn assumed the role of Director and Ms. Cohn the position of Director of Educational Programs for PSAP.

The target for the first Talent Search was the Tempe Elementary School District in Tempe, Arizona. Two weeks after initiating the process, Dr. Cohn was contacted by the Mesa and Cartwright School Districts (both within the Phoenix Valley area), and asked to expand the Search to include their pupils. A total of 270 students participated in the Talent Search testing procedure from the three districts.

In addition, 86 individual students from all over Arizona, who heard about the Talent Search through word-of-mouth, applied and participated, raising the total number of school districts involved to approximately thirty-five.

PSAP offered academic summer classes in 1980 to a group of 89 twelve and thirteen year old students who had successfully completed the screening procedures and who were eager to develop academically. The classes were taught for eight weeks and met once a week for five hours. They included Fast Math, Expository Writing, Computer

Science (BASIC), Mythology and Latin and Greek in Modern Day Usage, Study Skills, and a series of short workshops which covered topics such as Careers, Educational Planning, Family and Communication Skills.

At the same time the first Talent Search was underway, an Evaluation Clinic was established by PSAP at Arizona State University. The clinic provides a full profile of a student's specific abilities through a tailored testing program. After approximately eight hours of testing, the student, parents, test administrator and another member of the PSAP team meet to discuss the results and their implications for further educational planning. Parents are counseled as to ways to work successfully with their school districts; and PSAP's staff members work directly, where warranted, with the district to develop alternative educational options for the student as suggested by the results of the testing.

Since his arrival in Arizona, Dr. Cohn has spoken at more than fifty parent groups and school district meetings about PSAP's work and various methods to facilitate educational opportunities for academically talented youngsters. In addition, he has developed seven graduate courses at Arizona State University (ASU) in the area of educating the gifted.

PSAP developed academic year classes taught on ASU campus to extend and expand the work begun during the first summer session. Advanced classes in Plane and Solid Geometry, Algebra, Composition and Literary Analysis and a Math Tutorial Program (for eight through twelve year olds) were offered during both semesters of the 1980-81 school year. Approximately 40 youngsters participated.

In December of 1980, the second PSAP Talent Search got underway with mailings going out state-wide in Arizona and, with the cooperation of the State Parent's Council of the California Association for the Gifted, throughout many urban areas in California. Fourteen hundred and six (1406) Arizona students and 266 California students took part in April of 1981.

The summer program of 1981 served one hundred and seventy nine students from ten states. Forty seven of the students lived in the newly-formed PSAP summer residency program at Arizona State University's Best Hall Complex. The course offerings included Fast Math, Expository Writing, Computer Science (FORTRAN), Laboratory Science, Latin and Greek in Modern Day Usage, Mythological Themes throughout the Humanities, and four counseling workshops — Communication Skills, Career Exploration, Family Educational Planning, and Study Skills. The project also retained the services of a Family Therapist/Social Worker to facilitate staff and participants.

Fast Math classes and Expository Writing classes were added to the PSAP's offerings for eight through eleven year olds. The math classes emphasized computation, pre-algebra and algebra, and the writing class concentrated on basic writing skills.

PSAP's 1982 Talent Search is being conducted on a statewide basis in Arizona, California and Washington. Approximately 10,000 students from those states have submitted applications. PSAP is projecting a summer residency program of 100-150 students with about the same number in addition commuting to ASU for classes from the surrounding communities.

The course offerings will be essentially the same with the addition of two courses for twelve and thirteen year olds, one on World Geographical Themes and the other on Survey of the Social Sciences. A Science Exploration course concentrating on the scientific method is planned for eight through eleven year olds.

The PSAP Academic Year classes during 1981-82 at ASU will be Geometry Plus (includes Algebra and Trigonometry), First Year Algebra, Second Year Algebra, Advanced Composition and Literary Analysis, Expository Writing/Vocabulary Development for the twelve and thirteen year olds and Fast Math (computation/pre-algebra) for the eight through eleven year olds.

The Project also plans to present during the spring semester, a series of "Guided Exploration" Workshops for those students who show an interest in drawing (primarily cartooning) or media production. These workshops are likely to continue and be a part of the 1982 summer program.

Ultimately, PSAP plans to conduct the Talent Search throughout fourteen Western states. The projected year for attaining this goal is 1983.

Besides the Talent Search, Evaluation Clinic, Summer Program, and the Academic Year Classes, PSAP is working closely with the Litchfield Elementary School District's Project FUTURE (Facilitating Unlimited Talent Using Relevant Education) in a consulting capacity. Project Future is a K-8 program of educational facilitation for the academically talented, which began during the 1980-81 school year. It offers a math and a writing class at each grade level for academically gifted students and includes a study skills segment. PSAP is working with about eight other school districts throughout Arizona implementing similar programs using modifications of the Litchfield model. In addition, a conference was held at ASU, co-sponsored by PSAP and The College Board, August 21, 1981, for the purpose of promoting discussion among junior high and senior high school teachers about articulating the curriculum for intellectually able students. The special problems faced by minority populations and women in acquiring the best possible educational experiences for gifted individuals was also addressed. This discussion included preliminary work done by PSAP with highly able Native Americans.

During the winter of 1981, *The Chronicle of Academic and Artistic Precocity* was begun by PSAP as a forum for the exchange of ideas and research about the intellectually and artistically talented and as a vehicle to share PSAP's work with the general and academic communities.

PSAP's research has and will continue to go beyond pedagogical issues, addressing more basic questions, such as whether gifted children process information in a way that is qualitatively different from more typical children.

In the two-and-a-half short but busy years of its existence as a research and educational projct, PSAP, under the guidance of Sandy and Cathy Cohn, has grown to encompass three states formally and more than half a dozen informally, helping facilitate the education of hundreds of academically talented students and developing strategies and models for educational systems which can be applied at schools and universities throughout the United States.

*Craig Blurton is a second-year doctoral candidate in ASU's Department of Elementary Education with a minor in Educating the Gifted, where he is focusing upon science and outdoor education. He served as the Director of PSAP's 1981 summer residency program. He currently serves as a PSAP Project Associate.

1981 TALENT SEARCH GRAND WINNERS

Arizona: Donald Munsil

At the age of twelve years and eleven months, Donald, at the encouragement of his "gifted class" teacher, entered the Talent Search. He was shocked when he learned that he was the top winner for all of Arizona. He says that his parents, his older sister, and his gifted class teacher have had the greatest influence on his life to date.

His main interests centered around computers, especially designing and playing games. Fantasy role playing, war games, and Dungeons and Dragons are the focus of much of his energy. While not playing these games he is busy reading science fiction and fantasy.

Donald's ambition in education is to attend either Cal Tech or MIT. He hopes to be involved with computers with emphasis on problem solving and micro systems.

Northern California: Andrew Solovay

Andrew took part in the Talent Search at the age of thirteen years, nine months. The main influences on his life so far have been his parents and Snoopy (as a philosophical influence).*

His main interests at present are computers, especially fantasy and war gaming. He even belongs to a play-by-mail gaming club. He reads science fiction almost exclusively.

Andrew hopes to attend either Harvard or University of California at Berkeley to study physics and/or mathematics. He expects to become a professor, teach, and conduct research happily ever after.

*Andrew also felt that the film "Attack of the Killer Tomatoes" had been a major influence on his life. He declined to say whether this had been a major philosophical, religious, or botanical experience leaving that up to the reader.

Southern California: Adam Wantz

Adam entered the Talent Search when he was thirteen years and one month old. He entered to find out about his own abilities, to explore academic possibilities, and to meet other youngsters of like interests and ability. He credits his parents with providing him both with encouragement and being a great influence on the formulation of his values. He credits Dr. Cohn with having a major impact on his thoughts about his academic future.

Adam hopes to study advanced mathematics, English, and Science. Ultimately he aspires to a career in mathematics, science, or possibly law.

His hobbies include coin collecting, reading extensively, and occasionally playing arcade games.

TIPS (Tips for Intellectually Precocious Students) PARENTAL SUPPORT = TIME AND ENERGY[1]

William C. George[2]

In order for a gifted student to develop his talents to the fullest, the youth must be eager to seek appropriate intellectual challenges. This is especially true for the highly able mathematical reasoner desiring to accelerate his educational progress. Above and beyond this necessity, the most effective students have very supportive parents: support in this instance is the willingness to help their son or daughter obtain an educational program that is both satisfying and stimulating. Without active help from parents in translating appropriate aspirations into reality, a bright, well motivated youth may turn into an ineffectual, bored, even mediocre student who is unable to live up to his potential. One goal of the Study of Mathematically Precocious Youth (SMPY) is to show parents how they can assist their children in attaining proper intellectual stimulation. First, it is crucial for the highly able secondary school student to *want* to move ahead educationally. This decision can be made only by the youngster, not by a parent, teacher, or counselor, SMPY has found that after such a decision is made, it is important for the parent to interceded on the child's behalf. Listed below are a few hints that may assist parents who desire to help facilitate appropriate educational experiences for their sons and daughters.

1. It is important to remember that parents of a bright child need to spend as much time nurturing his or her talents as they would meeting the special needs of a slow or retarded child. The sterotypic statement that "the bright child will get along fine without any special assistance" is *false*.
2. In dealing with the school or school system, be sure to plan ahead. Make an appointment in advance with the person who will be most sympathetic toward meeting the needs of your child. For example, if the development of an appropriate mathematics program is in order, then the mathematics chairperson may be a good place to start.
3. Use tact and finesse. *Don't* blunder into the school unannounced. Be sensitive to other people and their responsibilities. This doesn't mean that you should be put of by arguments such as "your child is the exception," "we don't have any gifted," or "all of our students are bright and talented." Oftentimes well-meaning school personnel will suggest *not* moving ahead academically because of stereotypic arguments based on misinformation and prejudice. Be skeptical of their claims that acceleration may damage your child's social and emotional development
4. In planning your child's educational future, be sure to consult him or her. Long-range plans that include several options are much more appropriate than are stop-gap plans for one academic year. This means that planning must be started early enough in the school year (preferably at the start of the third quarter) for alternatives to the standard uniform lock-step grade process to be realized.
5. If there are other parents with students in similar situations, present your cases to the school as a group. Cooperate and enlist each other's assistance.
6. *Do not demand*, but ask. If you sense that a school official is about to say "no," ask him or her to think about the alternatives for a time, then meet with that person again. If a lower level administrator doesn't want to make the decision, talk with the next level person. Many times a person may agree, but feels that as an individual teacher, counselor, or principal, he or she does not want to make the final responsibility for making the decision, especially in favor of educational acceleration. Remember, too, acceleration includes many more possibilities than just grade skipping.
7. *Be prepared*. If documented evidence of ability is available, be sure to present that information in the conference. Ask for diagnostic testing to determine what yor child knows and doesn't know in a particular area. Often a small amount of instruction on specific topics of weakness will complete mastery in a given subject, thereby allowing a student to advance to the next level.
8. *Flexibility is crucial*. Suggest alternatives. It may take many hours of discussion with school personnel before a decision can be reached as to an appropriate program for your child. Your time and effort will determine the level of your child's education. Remember, there is no ready-made solution. Dialogue among parents and child and among school system and parents is the key.
9. Beware of labels. The terms "enrichment," "creativity," "higher level thought processes" may simply cover up a reality of busy work or a postponement of boredom till later.
10. Course credit should be given for what a bright child has learned. This is not an automatic process, and therefore nothing should be assumed. Sometimes, examinations or a simple request that credit be given will suffice.

Using these hints will not guarantee your success at creating an appropriate educational program for your child. It does, however, improve the chances. It is our strong belief at SMPY that parents bear considerable responsibility to their children to provide them the best possible education. Time, energy, a listening ear, and support are crucial variables in helping the gifted.

[1]This article was reprinted from the *ITYB* (Intellectually Talented Youth Bulletin), Volume 3, Number 10 (15 July, 1977), pp. 1-2.

[2]William C. George is Director of the Office of Talent Identification and Development (OTID) at the Johns Hopkins University. He served formerly as the Associate Director of the Study of Mathematically Precocious Youth (SMPY) at Hopkins.

PSAP'S 1981-82 ACADEMIC YEAR CLASSES

Three mathematics classes, two writing classes, and a number of exploratory workshops are being offered by the Project for the Study of Academic Precocity (PSAP) at Arizona State University during the 1981-82 school year.

The Mathematics classes provide elementary, junior high, and senior high school students an opportunity to obtain mathematics that would not be readily available to them in their school. The Math Tutorial, designed for mathematically able elementary students, focuses on math computational, pre-algebraic, and first-year algebraic concepts and skills (depending upon individual students' needs). This class allows students to cover more than one year's worth of mathematics by using diagnostic and prescriptive instruction to have them focus on the concepts that they need to learn (rather than waste time on material they already know). The Geometry-Plus and First/Second Year Algebra courses are designed for junior and senior high students who are mathematically able and academically eager. The Geometry-Plus class allows students to receive an excellent understanding of Plane and Solid Geometry as well as either College Algebra or Trigonometry (depending upon individuals' needs). The First/Second year Algebra class will provide individualized instruction to allow students to gain an understanding of first and second year algebra (and in some cases College Algebra) by working alone, in small groups, and in lecture situations.

The writing classes are designed for verbally able junior and senior high school students who are interested in obtaining either an excellent foundation or advanced skills in writing. The Expository Writing/Vocabulary Development class focuses on helping a student develop an extensive vocabulary through the study of root words and derivatives and an excellent foundation in writing through the study of grammar, semantics, syntax, styles of discourse (rhetoric), and techniques for organizing compositions. The Advanced Composition and Literary Analysis class is designed for the student who already has a solid foundation in writing skills and is interested in furthering his or her repertoire of writing styles and knowledge of literature. This class should prepare students to take the College Board's Advanced Placement English Language and Composition Examination in the spring.

In addition to the above mentioned, rigorously academic classes, PSAP is offering a set of "Guided Explorations Workshops". Unlike the academic classes with their stringent entrance criteria and demanding homework schedule, the Guided Exploration Workshop Series is designed to offer highly interested youngsters of sixth through eighth grade age opportunities to explore a variety of topics. Several nine-week workshops (each meeting one evening a week for two hours a session) are being offered this spring. One workshop focuses on the art of drawing cartoons, and the other on media production. Entrance requirements include an intense interest in the topic and willingness to take a number of different kinds of tests to help PSAP determine what,

if any, requirements need to be instituted for these workshops in the future.

Additional information about PSAP's academic classes and exploratory workshops can be requested by writing or calling PSAP at the address shown on the first page of the *Chronicle*. Be sure to specify the offerings in which you are interested and to include your name, address (with zip code), and telephone number.

ABLE AND AMBITIOUS: EARLY ENTRANCE TO COLLEGE, PART-TIME

Sanford J. Cohn, Ph.D.

Although the Project for the Study of Academic Precocity's (PSAP) Evaluation Clinic allows us to serve able youths of any age (to date our youngest client is 4 years old and our oldest is a college student in her late teens), perhaps our most ambitious effort focuses on our Talent Searches for Academic Precocity. Seventh and eighth graders (or youths in higher grades but of seventh or eighth grade age) who score in the top stanine (96th percentile or better) on an age-appropriate test of mathematical, verbal, or general reasoning ability are then invited to take The College Board's Scholastic Aptitude Test (SAT), a difficult test of mathematical and verbal reasoning abilities originally designed for college-bound high-school juniors and seniors.

Students who qualify by means of their scores on the appropriate sections of the SAT, mathematics, verbal, or Test of Standard Written English, may take part in special Talent Search Summer Classes conducted by PSAP on Arizona State University's campus. These classes cover rigorous academic content at a fast pace in precalculus mathematics, expository writing, computer science (at an introductory collegiate level), laboratory science, Latin and Greek in modern use, and mythological themes throughout the humanities. Also offered are counseling workshops on such topics as career exploration, study skills, communication skills, and family involvement in educational planning. A supervised dormitory residence program that includes recreational and outdoor educational activities is available during the summer months as well. An advanced level mathematics class and writing class are continued during the academic year for those youths who live near ASU campus. Students may continue to take PSAP courses for an additional summer or until they have demonstrated readiness to pursue college level course work.

On the basis of performance on the SAT and in the PSAP Talent Search Classes, a student may be invited to take a specific college course appropriate to his or her development of skill and ability in a particular content area. For example, PSAP's Computer Science course is an exact replica of the introductory computer science course offered in the College of Engineering's Department of Computer Science. In fact PSAP's class is even instructed by a teacher of that college course. Youngsters who perform well in this couse as a seventh or eighth grader are invited to take the next course in the college sequence, only this time for college credit. In the PSAP couse we can monitor student progress and provide additional support if necessary. These opportunities to maximize a student's success would not be available if we were to have the student simply enter the college course directly.

ASU has had a special classification of students for several years, so that local high-school seniors may enroll as "Able and Ambitious" students to take up to six credits a semester of college course work while they remain in high school. By means of a special arrangement between the Admissions Office and PSAP, qualified eighth and ninth graders (and older youths) have been admitted as "Able and Ambitious" students to take specific courses. A letter of application must be sent to the Admissions Office via PSAP and an "Able and Ambitious" application form must be completed. The student must also send a transcript of school grades and have the principal of his or her school write a letter acknowledging approval of the student's taking a college course while still in junior or senior high school. In addition to these materials, a letter is written to the Admissions Officer in which are documented the youth's SAT scores, his or her age at time of taking the test, and a description of his or her performance in PSAP's Talent Search Classes.

In addition to starting college early part time, some students use The College Board's Advanced Placement Examinations to earn college credits while they are still in junior or senior high school. In some cases an underage student has simply used up the curriculum at even the best high schools. In such instances the studeni may be admitted as a full time college student (often with advanced standing) with or without having earned a high-school diploma. Many U.S. schools offer the diploma automatically after the successful completion of the first year of college.

While we at ASU are enthusiastic and proud of the flexibility and educational resources that we can offer youths who are talented mathematically and/or verbally, we exercise great care to insure that the youngster will succeed in whatever academic alternative is exercised. It is on the basis of hard data in the form of SAT scores and past records of performance in rigorous academic couse work that an underage student may enter ASU, first part time, as an "Able and Ambitious" student, and then possibly full time.

In a few instances, ninth, tenth, and eleventh graders have sought PSAP's assistance to help arrange some college course work without having taken part in PSAP's special classes. The student is advised to take the SAT, report the scores to PSAP, and then attend a meeting with his or her parents and PSAP staff members. If it appears, after careful consideration, that part time college course work is advisable, arrangements are made to have the youth admitted as an "Able and Ambitious" student by following the procedure outlined previously.

Part time and full time early entrants to ASU are urged to meet with PSAP personnel periodically in order to discuss their progress and to make sure that they keep up with their work. Social adjustment is also monitored. In this manner potential problems can be spotted and appropriate support intervention provided.

Finding and helping intellectually able and eager youths to engineer educational alternatives is deeply rewarding both to the individual as well as to the university or college. In the past nine years since the Study of Mathematically Precocious Youth (SMPY) began in 1972, The Johns Hopkins University has experienced increases in the number of highly talented applicants and matriculants in an era of declining enrollment and talent in most U.S. institutions of higher learning. One simply cannot help but attract able and ambitious youths to excellent educational opportunities that are appropriate for them. Their positive feelings about and familiarity with the supportive institution that provides such services often lead them to become full time students there, if not for a full degree program, at least until their parents agree to allow them to move away from home to attend another university campus. In essence, such program options offer every party involved the opportunity to be a "winner".

TENTH GRADE TO COLLEGE

*Mary Frost**

Early entrance to college had never entered my mind through my early years of schooling, but I am presently a sixteen-year-old sophomore at Arizona State University. School had always been easy and boring for me. I guess I learned to accept the fact that school was to be easy for me; that if I did the assigned work, I was going to get straight A's. This past year has changed all of that for me.

During my sophomore year in high school, I participated in a statewide mathematics contest and, to my surprise, placed first among sophomores taking the test. In the spring I took the Scholastic Aptitude Test, as recommended by Dr. Sanford Cohn, hoping that somehow I would be able to accelerate my education with the aid of the opportunities provided by the Project for the Study of Academic Precocity (PSAP). My scores on the S.A.T. also surprised me. I had not expected them to be so high.

It was suggested that I take Calculus I at Arizona State University during the summer following my sophomore year. The words "calculus" and "university" were ominous enough to cause me some apprehension. I was comforted only by the knowledge that I could take a college Algebra and Trigonometry course as well, in order to complete my knowledge of the pre-calculus sequence.

My fears heightened a little when I went to register for classes. The representative from the math department taking registration questioned me extensively about my mathematics, without even knowing that I was just fifteen. He wished me luck with a doubtful look on his face, as if he expected to see me again in the math office asking to withdraw from the classes.

Once classes started, my apprehension vanished. I was so caught up in the thrill of learning that I didn't have time to worry. The eight weeks during the summer of 1980 had to be some of the most exhilarating of my academic career. For the first time, I was learning stimulating things at a pace that was comfortable to me; I earned A's in both math courses. In retrospect, it is apparent that the math courses at the high school would have been inappropriate for me.

As scheduling part-time high school/part-time college work proved to be impossible for the subsequent fall, I began to consider seriously the early-entrance alternative. I received notification of admission on

the day of fall registration.

At present (fall of my sophomore year), I have completed forty-eight semester hours in two semesters and two summers, making the Dean's Honor List each time. I have taken:

Calculus I/II	Differential Equations
Advanced Composition	Shakespeare I
French	Mechanics
Electricity & Magnetism	Computer Science
Chemistry	

My major interests are in the field of mathematics, but I also have a great involvement with music. At fourteen I played the piano in the Young Artists' Concert at Yavapai College in Prescott, Arizona (participants were chosen by audition). That same year I participated in the Honor's Recital, Senior Division, held at Phoenix Art Museum. When I was fifteen, I was hired to accompany two musicals: one at a local high school, the other at a community college. I have recently been hired to accompany a local symphony chorale.

This past summer (1981) I served as an instructor in PSAP's fast-mathematics program. This was a great experience made possible by my early entrance to college. It was thrilling to be able to provide young, able, and eager students with the opportunity they deserve to gain the knowledge they desire.

I have no regrets about my early entrance and can't imagine what it would be like to still be sitting in high school classes instead of advanced college courses.

*Mary Frost is PSAP's first radical accelerant. She left high school at the end of tenth grade to begin full time study at ASU. Currently in the spring of her second year (she actually has first semester junior status), Mary has been on the Dean's List every semester, carrying loads of 18 or more student credit hours in advanced mathematics, physics and chemistry for science majors, honors English, and the like. She also finds time to accompany the Scottsdale Symphony Chorus as their pianist.

SOCIAL AND EMOTIONAL DEVELOPMENT OF GIFTED STUDENTS

Peter M. Finlay, M.S.W.[1]

Since 1976 I have worked in the area of social and affective development in the academically precocious child and his family in varying roles: as individual therapist, family therapist, consultant, lecturer, and program developer. As a result I have been able to observe and learn from both clinical and didactic settings about the social-emotional evolution of families containing an intellectually adept child and the problem-solving mechanisms and abilities of this group.

The single most important cause of what can be perceived as social-emotional dysfunctioning in precocious children derives from the pressures and impediments placed by an underinformed society upon them. Such pressures and impediments range from a forced suppression of individual ability in the name of conformity to the internalization by extremely intelligent children of negative self-concept messages to the lack of support of parents of these children in dealing with the needs of precocity within the family structure and the marriage relationship.

Resources do exist for remedying those situations which exceed the level of normal concern. The Project for the Study of Academic Precocity (PSAP) at Arizona State University has available two workshop formats which can be given at local sites: a Communications Skills Workshop in four sessions designed to teach through modeling and practice more effective communications by precocious students entering adolescence with their parents and society; a Parent/Family Workshop in three sessions covering the development of healthy family structures, effective discipline and care, methods of implementation, and suggestions for generating better self-concept in the children of these families. In addition, a model for counseling designed to meet the needs of precocious youths, emerging adolescence and family are available. It is known as "Bi-modal Intervention"[2] and its earmarks are adaptability to location, ease of teaching service providers, and high degree of cost-benefit. It is appropriate in both clinical and educational settings.

I would like to assure those concerned that precocious children who are "troubled" make extraordinary and efficient use of supportive intervention and tend to have a strong drive toward health. A little on their behalf tends to go a long way. Indeed, more often than not the removal of system impediments to the placement of intellectually advanced children at their true level of learning competency frequently is the *only* act of intervention required to restore and reinforce what would be perceived as "normal" and acceptable socialization skills for this group. A strong case for the appropriateness, effectiveness, and economy of intervention for these children is documented and elaborated by Robert J. Sternberg, Ph.D., Psychology Department at Yale University, in his article "A Componential Theory of Intellectual Giftedness" appearing in *Gifted Child Quarterly* (Vol. 25, no. 2, Spring, 1981).

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[2]A more detailed description of "Bi-modal Intervention" appeared in an article by Sanford J. Cohn and Peter M. Finlay, entitled "Treatment of behavior disorders among intellectually gifted youngsters: Case studies with a family-centered approach" in the *Monograph in Behavioral Disorders*, Tempe, Arizona: Arizona State University, Summer 1980.

LUCK, PLUCK, and PLUTO

*Eileen Phelps**

Everyone loves a happy ending to a story, but most of us expect the middle part to have a few problems and setbacks. Our hero must overcome obstacles to attain his goal, or where's the plot?

A highly satisfactory ending for a story about two scientists would include the discovery of something new under the sun, such as a planet. Supply the name of Percival Lowell for the rich man and for the young hero, choose poor but aspiring Clyde Tombaugh. Add the guarantee that the story is true and all the elements are at hand for another episode of The American Dream.

Percival Lowell was born in Boston March 13, 1855. His family was wealthy as well as prominent, having boasted a member of the Continental Congress, a Massachusetts legislator, a minister to Great Britain, two pioneering horticultralists, and several authors and scholars. Percival's brother, A. Lawrence Lowell, who later became president of Harvard, tells of their father's expectations for his children, in view of their fortunate circumstances: "Somehow he made us feel that every self-respecting man must work at something that is worthwhile, and do it very hard. In our case, it need not be remunerative, as he had enough to provide for that; but it must be of real significance" (Lowell, 1955, p.5.).

Percival began his education at Miss Fette's dame school and then was taken to Europe, where he attended French boarding schools. He learned the French Language quickly and was excited over everything he saw in his summer travels about the Continent. Back in Boston, Percy received a classical education from Miss Fette's brother and Mr. George Noble. He was always near the top of his class, and his brother recalled he once wrote hundreds of verses in Latin to describe the shipwreck of a toy boat.

Although he was ready for college at sixteen, Lowell postponed this for a year while he took special tutoring in English composition and mathematics. Mr. Noble thought he needed the extra instruction, but Lawrence Lowell thought Percy's "interest in these matters had not been aroused" (Lowell, 1935, p.5.). He entered Harvard with honors in math, took second-year honors in it, and studied it each year. Professor Benjamin Pierce said "He is one of the most brilliant mathematicians of all those who have come under my observation" (Simon, 1962, p.52). Percy did well in composition also, winning a Bowdoin Prize for an essay on England. He was also Phi Beta Kappa, and he spoke at the commencement exercises.

Lawrence must have been aware of the stereotype of the gifted misfit because he comments: "Yet he was no recluse; for he was constantly that year at dancing parties in Boston; and, being naturally sociable, and strongly attached to his friends, he made many in college" (Lowell, 1935, p.6).

After schooling was complete he toured the Middle East and then spent nearly six years helping to manage the family's businesses. In 1883 he went to Japan where he made many friends and again learned the language rapidly. He distinguished himself by accompanying the first Korean delegation to the U.S. and by writing several much-admired books on Korea and Japan.

When Lowell decided to make astronomy his life's work, he had no need to go back to school; he had kept his mathematical learning through membership in the Mathematical and Physics Club with other members from Harvard and M.I.T. and Dr. Hasket Denby, the leading ophthalmologist in Boston had said that Lowell's eyesight was the keenest he had ever examined. Lowell wanted to observe the "canali" on Mars, as reported by Schiaparelli, whose eyesight had recently failed.

But education and enthusiasm are not enough. An observatory must

be available in a location where the atmosphere is clear and stable. Since Lowell could afford to, he decided to build his own, and off he went to search for the right spot. The Lowell Observatory in Flagstaff, Arizona, stands as perhaps his greatest contribution to science. Percival Lowell was a trailblazer in conducting observations far from the light and smoke of population centers.

Lowell was also a maverick among other scientists, who considered him an amateur. He was unconnected with any university. And he deliberately drew conclusions with scant data because he felt that the greatest scientists had often done this. Generally he was open-minded and changed his theories as new discoveries warranted, except in the case of the canals (channels) of Mars. To the end of his life he passionately argued that these were the work of intelligent beings trying to stay alive on a dying planet.

Besides the Mars observations, Lowell studied other parts of the solar system: the rotations of mercury and Uranus, the rings of Saturn, the clouds of Jupiter, and the asteroid belt. Hundreds of asteroids were discovered by him, and he developed theories about them and about the life cycle of planets. But the study that engrossed him the most was the perturbations of Uranus and Neptune. These pointed to the gravitational pull of a still-undiscovered planet. Using the best figures available, Lowell calculated the orbit of Planet X and began a long search for it.

Lowell was a popular speaker in this country and in Europe. He was an honorary member of the Royal Astronomical Society of Canada, and he received medals from the national astronomical societies of both France and Mexico. But his many trips to give lectures, as well as to conduct his business and to visit his observatory helped to break his health and shorten his life. He died of apoplexy on November 12, 1916. Lawrence says, "Before he became unconscious, he said that he always knew it would come thus, but not so soon" (Lowell, 1935, p.194). Percival Lowell had wanted to find Planet X, but his good fortune had finally run out.

Enter Clyde Tombaugh. Clyde was born in 1906, near Streator, Illinois. He was the oldest of six children of a tenant farmer. Percival Lowell had been dead for a year and a half before Clyde had his first look through a telescope at the age of twelve. But that first look set the boy on the trail that Lowell had pointed out. The telescope belonged to his uncle Lee, and Clyde's father had often looked through it. Although Clyde had shown great interest in microscopes and in geography, he had never before been invited to come along to peer into the heavens.

Now Clyde was fascinated with astronomy. He read his uncle's books completely, walked many miles to the library to borrow all they had, and saved his pennies to buy more. For as long as five hours a night, after school and chores were done, Clyde would look through the telescope his uncle let him borrow. He mapped the planets and kept a diary of his observations. He began to make sketches of Jupiter's moons.

When Clyde was thirteen he tried to build a small telescope using a reading lens and a tube of rolled sheet iron he'd found. It didn't work, but Clyde didn't discourage easily. When his uncle bought a new 40 power telescope with an achromatic lens, Clyde was able to get his first close look at Mars.

Clyde's father rented a better farm near Burdett, Kansas when Clyde turned 16. Clyde had more chores than ever, but he kept his interest in astronomy. To find the time for it, he had to give up the social life typical of his age. His classmates at Burdett High School nicknamed him Comet Clyde. In the yearbook they predicted, "He will discover a new world" (Simon, 1962, p. 75).

But fortune was not ready to smile on Clyde. His father could not spare him from the farm to go to college. This was a great disappointment, but Clyde was unstoppable. He found an article telling how to build an 8-inch reflector telescope. He husked corn for a neighbor to buy the glass. He built the tube out of wood. But wood warped and the mounting wobbled. The mirror was weak. But his father encouraged him not to give up.

Clyde sent to the Scientific American for instructions they had published. He read books on lens-making. He determined that a constant temperature was needed, so he dug a cave and cemented the sides. The cave was 24' long, 12' wide, and 7' deep! He ground his first lens too thin and had no more money. Still he didn't quit; he contacted his uncle, and offered to build him a telescope to earn the money for new parts for one of his own. This telescope was a success. Clyde's youngest brother Robert and their father helped with the making of Clyde's first good telescope. It cost $36 and was worth $1000.

Clyde made many observations; but it was a set of drawings of Jupiter and Mars that he sent to Lowell Observatory that gave Clyde his next opportunity. Dr. V. M. Slipher, who was the head of the observatory, was so impressed he wrote to Clyde and offered him a job. The job? Looking for Planet X.

Like Percival Lowell's father, Clyde Tombaugh's father had advice: "Do the smallest job as if it's the most important one in the world. And if you make a mistake, own up to it. Then try to do better next time" (Simon, 1962, p. 86). Clyde followed his father's advice and made astronomical history.

In 1929, the Lowell Observatory had installed a new telescope and camera combination better than anything used before. And a new device called the Blink Comparator allowed rapid comparisons to be made of pictures taken on different nights. These improvements, together with Lowell's calculations and Clyde Tombaugh's painstaking accuracy, resulted in 1930 in the discovery of Planet X, later to be named Pluto, partly in honor of the man who inspired the search, Percival Lowell.

There is an element of irony in the happy ending to this story. Although Lowell's calculations were correct and his predicted orbit very close to the actual one, the data upon which Lowell based his calculations has been found to be erroneous: Pluto was found by happy accident! Many questions remain unanswered. Are there more Planet X's? Some scientists think so. Clyde won his chance to go to college by finding Pluto. He has searched for other planets many hours since. Though he felt in 1962 that none would be found with present-day equipment, a lot has been developed since then!

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*Eileen Phelps is an ASU graduate student and fourth grade teacher in Mesa, Arizona. Born and raised in Rochester, New York, she studied piano for 14 years under a former student of Leopold Godowski and Pablo Casals. She taught piano lessons from 5th grade, attending Irondequoit High School half time in her junior and senior years in order to spend more time with music.

After attending Brigham Young University for two years, she married a 4th generation Arizonan and settled in Mesa. While working, helping her husband through school, and raising three boys, she completed a semester of college by correspondence and attended classes one and two at a time to complete the Bachelor's and Master's degrees.

PSAP SPRING WORKSHOP OFFERINGS

Are you a parent of a gifted child who needs information about helping your child achieve his or her potential? Do you have a gifted child at home who is interested in cartooning or radio and television broadcasting and production and is in the sixth through the eighth grades? Does your gifted child have intellectual talent but not the study skills to develop it effectively?

If you answered yes to any of these questions, help is on the way. The Project for the Study of Academic Precocity (PSAP) at Arizona State University, under the direction of Dr. Sanford J. Cohn, is offering workshops for gifted sixth through eighth grade students and the parents of gifted children of all ages this spring.

The workshops, to be held on campus, will include Study Skills, Cartooning, Electronic Media: Radio and Television, and Family Development Issues in Educating Gifted Children. Fees will vary ranging from $30.00 per family for three sessions of the Family Development Workshop to $60.00 per student for the six sessions of the Study Skills Workshop.

Eligibility for participation in the Study Skills workshop will be determined by prior participation in PSAP's Academic Talent Searches, testing in PSAP's Evaluation Clinic or scoring in the top five percent of the student's age-group on a standardized test of ability or achievement. Students who wish to enroll in the Cartooning or Electronic Media Workshops will be selected according to intense interest (willingness of students to take a battery of ability and skill tests is required).

Parents of gifted students who have participated in PSAP's Talent Searches for Academic Precocity or who have been clients of PSAP's Evaluation Clinic are eligible for participation in the Family Development Issues Workshop.

An application form for the workshops or more information can be obtained by writing: PSAP Spring Workshops, Department of Special Education, Arizona State University, Tempe, Arizona 85287 or calling (602) 965-4757.

1982 TALENT SEARCHES ACROSS THE UNITED STATES

*Cathy Cohn**

The Project for the Study of Academic Precocity (PSAP) in the Department of Special Education at Arizona State University is sponsoring the Western States Talent Search for academically able seventh and eighth graders (or students in higher grades born not sooner than January 1, 1968). The Talent Search region includes all of Arizona, California, and Washington for the January 1982 testing. The region is anticipated to include 12 western states (Arizona, California, Oregon, Washington, Idaho, Nevada, New Mexico, Colorado, Wyoming, Montana, Utah, and North Dakota) plus Alaska and Hawaii by 1983-84.

In order to be eligible for the Talent Search, students must have scored at least at the 96th percentile (9th stanine), when compared against national norms, on a standardized ability test, intelligence test, or any one of the following subtests of a standardized achievement test battery: reading, vocabulary, language usage, total verbal, math concepts, math applications, problem solving, total math, or total battery. Students are eligible if they have met any one of these qualifications on *either of the two most recent administrations of a standardized test*.

The Talent Search is a chance for students to receive a realistic appraisal of their mathematical and verbal ability and to provide parents and schools with information that can be important in enhancing appropriate academic planning. Although the deadline for the 1982 Talent Search is past, persons interested in obtaining more information about future Talent Searches should call PSAP at 602-965-1460 or write to: Talent Search, PSAP, Department of Special Education, Arizona State University, Tempe, AZ 85287.

Seventh graders in other areas of the United States also have an opportunity to participate in a talent search. The Office of Talent Identification and Development (OTID) at The Johns Hopkins University in Baltimore, Maryland, sponsors a six state (plus District of Columbia) Talent Search that includes Delaware, Maryland, New Jersey, Pennsylvania, Virginia, and West Virginia. (A more informal effort is aimed at New York and the New England states.) Information about the OTID Talent Search can be received by contacting William C. George at 301-338-8427, Talent Search, OTID, The Johns Hopkins University, Baltimore, Maryland, 21218.

There is also a Southeastern States Talent Search sponsored by the Talent Identification Program (TIP) at Duke University in Durham, North Carolina. The sixteen state region includes Alabama, Arkansas, Florida, Georgia, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, North Carolina, Oklahoma, South Carolina, Tennessee and Texas. Information about TIP's Talent Search can be received by contacting Robert Sawyer at Talent Search, TIP, West Duke Building, Duke University, Durham, North Carolina, 27708.

Other talent search efforts are being conducted in Illinois, Wisconsin, and Nebraska. Requests for information about them should be directed to the respective State Department of Education.

For students all over the United States, Julian C. Stanley, Director of the Study of Mathematically Precocious Youth (SMPY) and originator of the talent search concept at The Johns Hopkins University in Baltimore, Maryland, is conducting a search for any students who score 700 or better on the mathematics section or 630 or better on the verbal section of the Scholastic Aptitude Test (SAT) before their 13th birthday. For more information on the "700 before 13" search, contact SMPY by calling 301-338-7087 or writing SMPY, Department of Psychology, The Johns Hopkins University, Baltimore, Marland 21218.

*Cathy Cohn is PSAP's Associate Director. She is also a first-year doctoral candidate in ASU's Department of Special Education focusing on the needs of gifted children.

1981 SUMMER PROGRAM REACTIONS FROM PARTICIPANTS

A Summer Writing Course

*Byron Auguste**

My name is Byron Auguste. I am fourteen years old and live in Scottsdale, Arizona, with my parents, my brother, and my sister. Last year, I attended Desert Shadows Middle School in the Paradise Valley School District. This year I attend Horizon High School in that same district.

For the past nine months I have been involved in a program sponsored by the Project for the Study of Academic Precocity (PSAP), which is a part of the Special Education Department of Arizona State University. The major component of this program, which offered the opportunity for education enrichment, advanced placement courses, academic recognition, and scholarships, was the taking of The College Board's Scholastic Aptitude Test (SAT). When my school counselors gave me the information from PSAP concerning the program, I was interested immediately. My parents thought it was a good idea for me to test my abilities against other advanced students of my age, so I decided to participate.

After I had received my SAT scores, I was sent information concerning the 1981 PSAP summer classes which were scheduled from June 21 through July 31. At first I was extremely reluctant to give up so much of my summer vacation to attend classes of any sort, buy my parents felt that the classes presented an opportunity too wonderful to be missed and were able to convince me to take at least one class. Since I had done best on the verbal skills segment of the SAT, we agreed that I should enroll in the class on expository writing.

Although I doubted whether the benefits to be derived from this class were worth the effort, it turned out to be an enriching experience for me, both academically and socially. There were only twelve class periods in the whole course, but the classes were long, three and a half hours. Time seemed to pass quickly, however, because of the teaching methods used. Instead of learning through repetition, the class was presented with information which was utilized in the daily exercises, as well as in the weekly essays, which covered several forms of writing.

I derived great benefit from the people whom I met; the instructors were helpful and friendly. There were students in attendance from many different parts of the country. I met many whose interests were similar to mine, and many others who were involved in fascinating hobbies and experiments about which I knew little. I also made a few permanent friendships.

The least appealing aspect of the program was that it required so much time. There was quite a lot of homework. There were sometimes lengthy reading assignments, writing exercises, and, as I have already mentioned, weekly compositions of about four hundred words. Altogether, these totaled up to six to eight hours of homework each week. Additional time was spent traveling, by bus, back and forth to ASU. Classtime and travel time combined, I spent eight hours away from home for two days a week, and then spent several more hours doing homework. My parents have always encouraged me to take advantage of educational opportunities. They have supported me in every possible way. This case was no exception; they rearranged their schedules to accomodate mine and made it a lot easier for me to do well in my expository writing course.

Overall, the PSAP summer program was a tremendous success, at least from my point of view. If I had to decide again whether to enter the program, I would do so without hesitation.

*Byron Auguste was the top verbal scorer in PSAP's 1981 Talent Search.

Summer in Residence

*Meshell Johnson**

When I entered the Talent Search, I was twelve years and four months old. I took part because my parents urged me to do so. The program did sound very interesting, and I thought of it as a special type of challenge.

To begin with, I have a large number of hobbies and interests (such as reading, collecting foreign money, watching television, and shopping). I am also interested in school, and after I graduate from high school, I would like to attend a college on the East Coast, become a Rhodes Scholar, continue my education in Europe and work for my doctorate in the field of my choice. I hope to accomplish this, and my parents (who have provided the most influence on my life) want me to complete my goals to the best of my ability.

I participated in the PSAP summer program because my parents and the counselors at my school strongly recommended it and thought that it would be a good chance to learn something and gain a whole new experience during the summer. At home, some of my friends thought that I was crazy because I would give up my summer fun to go to school, but they all knew and understood why I did it and later said